

PATENT SPECIFICATION



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COMPLETE SPECIFICATION

NO DRAWINGS

Process for Bonding Hydraulic Cementitious Materials to Base Material

We, PHYLLIS HOLMAN LARSEN, of 4934 Elm Street, Bethesda, Maryland, and GEORGE GEATTY GROOME, of 8209 Flower Avenue, Takoma Park, Maryland, United States of America, both citizens of the United States of America, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to a process for bonding hydraulic cementitious materials to base material and, more particularly, to a method of plastering whereby cementitious materials such as Portland cement or gypsum plaster may be firmly bonded to any base structure such as, for example, concrete block, cinder block, wood, brick, "rock lath", and monolithic concrete slabs. The invention is further directed to the laminated structure resulting from the use of the method of plastering described herein.

The problem of applying hydraulic cementitious materials as a surfacing agent to wood, cinder block, monolithic concrete and the like is a difficult one, and none of the solutions hitherto suggested have been entirely satisfactory. It is well known, for example, that one cannot successfully apply a coating or layer of a finishing coat of cement to a set concrete base because the finishing coat cracks and does not form a firm, permanent bond between the concrete base and the applied coating. Nor is it possible to apply coatings or layers of such cementitious materials to other kinds of base materials, such as wood, metal, glass and the like. In fact, much new building is composed of poured, smooth monolithic slab concrete and no practical way is now available for applying plaster finish coats to such materials. Consequently most of the finish coats for wall surfaces and the like are painting jobs, and the rough coat flooring has been surfaced with asphalt tile for appearance.

[Price 3s. 6d.]

Thus, the problem of developing a process for surfacing base structural materials of the kind stated with plasters such as lime gypsum materials, fine finish coatings of Portland cement, and the like, is a very real one in this art. The method most commonly used heretofore is that of applying an adhesive coating to the base material which is in the nature of an asphalt emulsion. The plaster is applied over this adhesive coating. It is necessary to apply the plaster immediately after application of the adhesive coating since the action depends upon the tack qualities of the adhesive. In the course of time such finish coatings applied by that process crack and craze because of the deterioration of the underlying film of asphalt, a material notoriously susceptible to oxidation, temperature changes, and internal break-down of the constituents thereof.

The present invention is directed to the method of applying plaster whereby the plaster is interlocked with the base material through the intermediary of the bonding agent. It can be readily seen that by virtue of this interlocking effect obtained according to the method herein disclosed results are possible which were not realized by prior art processes wherein the plaster was, in effect, glued to the base material.

The presently described process contemplates the use of a bonding agent which is an aqueous emulsion of the polyvinyl acetate resins which are compounded with additional agents to produce the bonding material suitable for use in the presently described process.

One of the outstanding features of the present invention is the use of a bonding agent which permits the plaster to be applied at any time after the application of the bonding agent to the base material even if the bonding agent has dried out. In methods employed heretofore it was essential to apply the plaster immediately after the application of the asphalt emulsion for, in the event that

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the asphalt dried, it was completely ineffectual in glueing the finish coat to the base material.

It has now been discovered that polyvinyl acetate aqueous emulsions have remarkable properties for use as bonding agents in the practice of our invention. These emulsions do not oxidize as do the asphalt emulsions. Moreover, the deposited solids of these emulsions readily re-emulsify when brought into contact with water as, for example, when wet gypsum plaster is applied to a base structure covered with such deposited solids, essentially polyvinyl acetate.

While the invention embraces broadly the use of such polyvinyl acetate aqueous emulsions and, as such, is entirely operative, it has been found that the addition of plasticizers and the like is beneficial.

One bonding agent found suitable for use in the present invention is an aqueous emulsion of polyvinyl acetate resin with the addition of plasticizing agents including polychlorinated diphenyl, tricresyl phosphate, and hexylene glycol.

One suitable composition is composed of about 100 parts by weight of the commercial polyvinyl acetate emulsion (55 to 60% solids) 8 parts by weight of the polychlorinated diphenyl, 8 parts by weight of tricresyl phosphate, and 2 parts by weight of hexylene glycol dissolved in 5 parts by weight of water. In formulating this mixture, it is preferred to first admix the polychlorinated diphenyl and tricresyl phosphate together at a slightly raised temperature, about 100-110°F., to blend these two materials thoroughly together after which the mixture is added to the polyvinyl acetate emulsion with stirring. The hexylene glycol solution is then added. Thereafter the bonding agent and the plastic particles in the bonding agent draw together until a barrier is formed. Similarly, the particles in the emulsion of the bonding agent fill the pores in the base material. Thus, it can be seen that an interlocking is obtained between the finish coat and the base which effect is not contemplated by any of the prior art methods.

However, while it is believed the enhanced adhesiveness is due to this "interlocking" of plaster and emulsion film, the invention is not to be limited to this theory.

As stated above, the bonding agent may consist simply of the commercially available polyvinyl acetate aqueous emulsions. Advantageously, however, plasticizers such as those referred to above are also present.

It is to be noted that our Specification No. (Application No. 2097/59 (Serial No. 822277)) is directed to a composition for bonding a hydraulic cementitious material

to a base surface, comprising an aqueous emulsion of a polyvinyl acetate resin, and a plasticising agent including polychlorinated diphenyl and tricresyl phosphate.

WHAT WE CLAIM IS:—

1. A process of applying a hydraulic cementitious material, e.g. plaster, to a base material, which comprises coating the base material with a film comprising an aqueous emulsion of a polyvinyl acetate resin, the deposited solids of which will re-emulsify in contact with water, and thereafter applying the hydraulic cementitious material in a wet state to the treated base material.

2. A process according to Claim 1, in which the film is dried, or allowed to dry, before the cementitious material is applied.

3. A process according to Claim 1 or 2, in which the film is applied by spraying.

4. A process according to any of Claims 1 to 3, in which the emulsion, in addition to the resin, comprises hexylene glycol.

5. A process according to Claim 4, in which the emulsion further includes tricresyl phosphate.

6. A process according to Claim 5, in which the aqueous resin emulsion comprises about 100 parts by weight of an aqueous emulsion of a polyvinyl acetate resin, about 8 parts by weight of a polychlorinated diphenyl, about 8 parts by weight of tricresyl phosphate, and about 2 parts by weight of hexylene glycol.

7. A laminated structure comprising a base material, a coating thereon comprising a film composed of the solids deposited from an aqueous emulsion of a polyvinyl acetate resin, said solids being re-emulsifiable, and a set hydraulic cementitious material, e.g. plaster, overlying and adhering to said coating consequent upon setting thereon.

8. A structure according to Claim 7, in which the solids are those deposited from an emulsion of polyvinyl acetate and polychlorinated diphenyl.

9. A structure according to Claim 7, in which the solids are those deposited from an emulsion of polyvinyl acetate, polychlorinated diphenyl, hexylene glycol, and tricresyl phosphate.

10. A structure according to any of Claims 7 to 9, in which the base material is concrete, plaster, cinder block, brick, or monolithic concrete.

11. The process of applying a hydraulic cementitious material to a base material, substantially as herein described.

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